THE BULLETIN

Vol. VI. No. 2

Hydro-Electric Power Commission of Ontario

AUGUST 1919

Falls on St John's River, Quebec

THE BULLETIN

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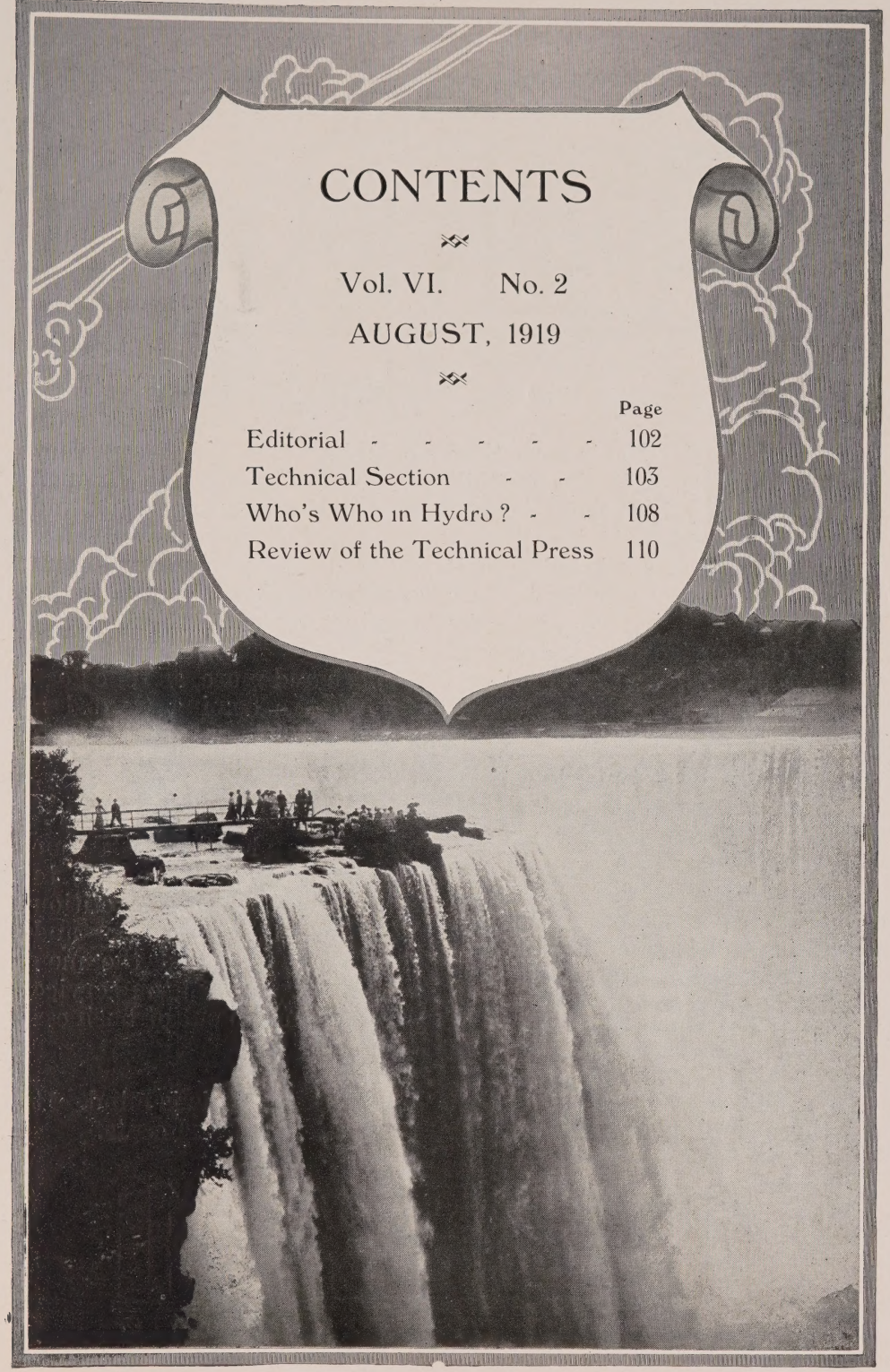


Editorial

The Test of Public Opinion

HYDRO is more than ever in the people's minds these days of Radial Railways. And this being so, it is more and more important that we all make public service our watchword and courtesy and efficient service for the people of Ontario our constant aim.

Every Hydro employee and everyone connected with local Hydro-Electric systems represents Hydro to the public. A thoughtless word or action is often remembered for a long time, and it sometimes breeds the suspicion that public servants are prone to be careless of the feelings of the public they serve.

We really do not think that there is much necessity for bringing this point out very forcibly, because Hydro men everywhere are up-to-date and progressive and they realize fully just how great a part courtesy and service play in the conduct of modern business.

More and more, as time goes on, we are coming toward a standardization of quality and price in almost everything. This is a process of natural evolution. And, when this finally comes about, what is one merchant going to be able to get business on, in competition with the others? Service—and service alone. And the men who are not strong on service are going to go out of business quick.

Let us keep this is mind. It pays in dollars and cents.

Technical Section

Cobourg Water Supply

By A. E. Davison

Hydro-Electric Power Commission

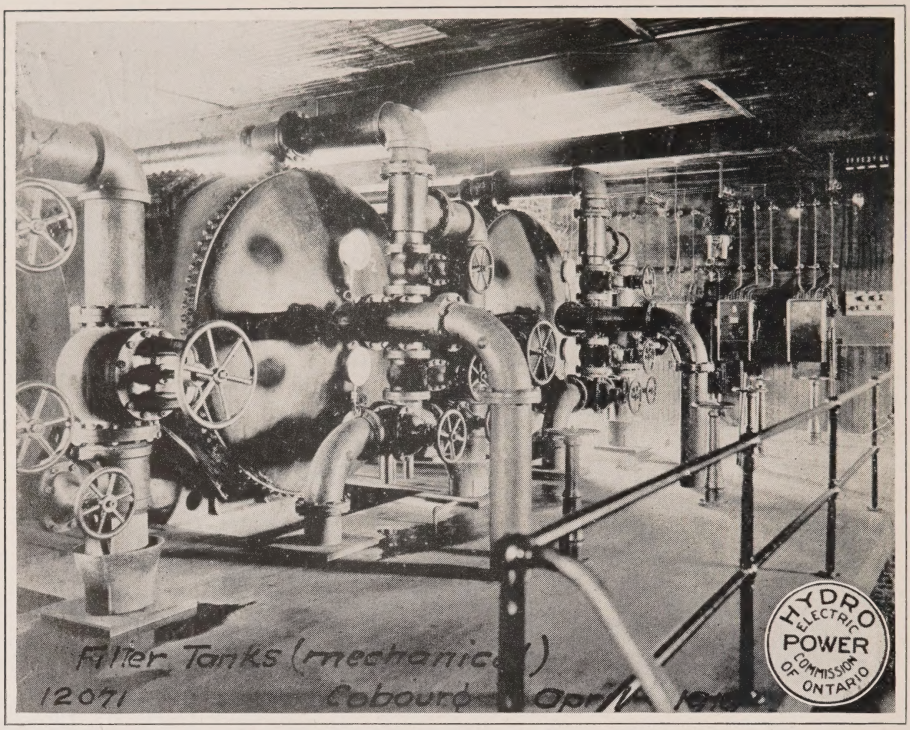
COBOURG is a town of about 5,000 inhabitants, obtains its water direct from Lake Ontario. The pumping station originally contained an electric power plant, to which was added a belt-driven turbine pump for supply of water to the town, with two steam pumps of the compound duplex type for fire service.

The system was bought up by the Seymour interests when the Trent River was developed, the electrical section of the plant was then disposed of, and a layout made of a motor-driven pumping plant and pressure filter system located in the old building.

The water entered the suction well through a 12-inch intake laid upon the rock bottom of the lake and anchored thereto, and a 14-inch suction pipe with foot valve supplied the pumps from the well. In addition to this, an auxiliary supply was available from six drilled wells adjacent to the station. This water was highly mineralized, a smell of sulphur being distinctly noticeable, and on account of its corrosive quality this source of supply was only used for emergency, and for clearing the intake of trash and ice, which gave trouble in the winter season.

Four pumping units were installed, each of 750 g.p.m. capacity, arranged to operate in parallel for domestic service and in pairs in series for fire service, giving domestic capacity of 1,500 g.p.m. with reserve domestic capacity of the same amount. Pressure for domestic service is from 70 to 75 pounds, and for fire 100 pounds at the pump-house, excess pressure under fire combination with small demand being taken care of by relief valves.

The filter plant consisted of three horizontal units 8 feet diameter and 20 feet long, of extra heavy construction, and with the usual connections for simple back wash. The control end of the filters is shown on Photo No. 12071. The rating of each filter is 270 Imp. g.p.m. at 1.67 g.p.m. per



square foot, which is satisfactory for muddy and contaminated water, but under present conditions with supply taken off a clean rock bottom over 20 feet below the surface, the quality of water is so good that the above rate can easily be increased 100 per cent., giving a capacity of 1,600 g.p.m. under normal operation, with further increase during fire demand. Soon after this installation was made, the town standpipe was wrecked by a fall of ice, and the system has been operated to the present time as a direct pumping proposition without reservoir.

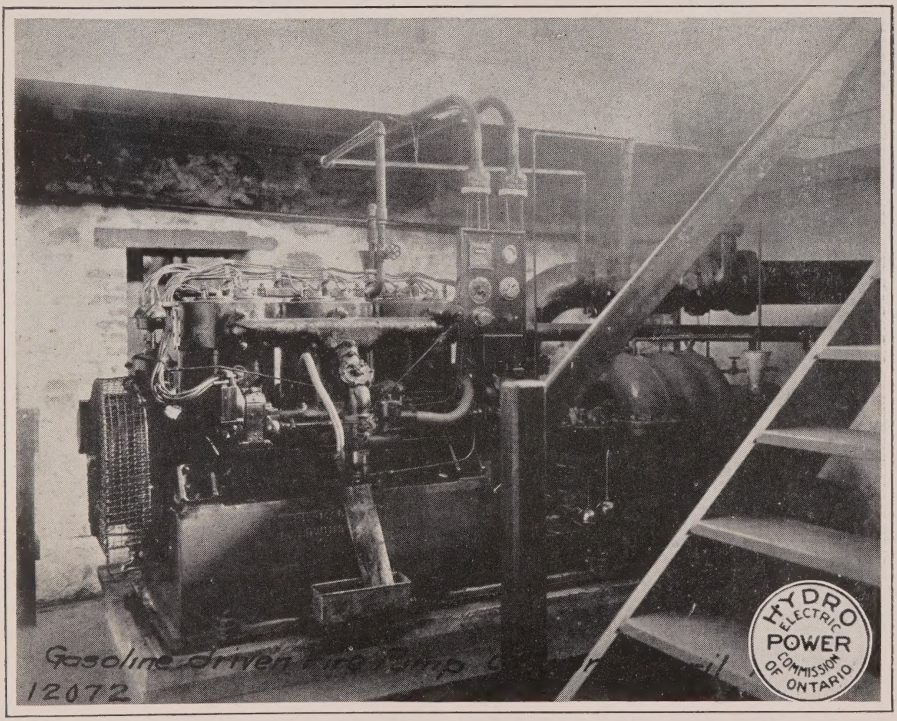
The location of the station is at a point on the lake shore which receives full force of all storms and there is much ice accumulation in the winter, resulting in excessive turbidity of the water near the shore and the breaking away of section of the intake pipe from time to time, so that when the system was acquired by the Hydro-Electric Power Commission of Ontario, a new intake was necessary to ensure against failure of the water supply and to relieve the filtration plant of excessive load and constant back washing at certain seasons of the year.

A new intake was completed in 1916, of riveted steel pipe, 25½ inches diameter, 900 feet long, laid in a channel blasted in the rock bottom of the lake and back-filled with rock, the pipe ending in a steel intake box of ample dimensions, securely anchored in about 20 feet of water. A new suction well was blasted in the rock 10 feet by 30 feet by 15 feet deep, and

covered by a brick annex to the old building. The suction main was extended to this well and the old well left for the supply of the steam reserve. The cost of the intake and suction well was about $38,000. This was higher than originally estimated, due to the impossibility of maintaining drill boats, dredges and tugs at work in the lake except in unusually fine weather.

At this time an automatic device was installed for coagulant and hypochlorite in place of the usual hand-controlled feed apparatus with small orifices of uncertain operation. The new device is mechanically driven by a turbine placed in the mouth of the intake pipe within the suction well, of sufficient size to operate the device under velocity head only, and with as low a discharge as 300 gallons per minute. The power required being extremely small, the speed of the turbine is proportional to the flow of water in the intake, and the device for feeding each chemical solution consists of a revolving disc on which are mounted small buckets which dip into the solution, the level of which is held constant by float control after the manner commonly obtaining in orifice boxes. The buckets discharge into a trough, from which direct pipe connection is made to the suction well. The speed of the buckets is adjustable over a wide range by friction disc drive from the turbine for any strength of solution or rate of dosing. The device arranged for two solutions is shown on Photo No. 12073.

Previous to the year 1917, it was necessary to hold steam at 40 pounds pressure on the boilers as reserve for



the steam pumps for fire service, and for occasions when electric power went off, and the cost of this reserve becoming serious with the rise in price of coal during the war, it was decided to replace this part of the plant with two gasoline-operated units drawing water from the new suction well, and to abandon the old well and intake. One of these units was installed about a year ago in place of one of the steam pumps, and consists of a 1,200 g.p.m. Morris pump coupled to a six-cylinder Van Blerck engine, running at 1,500 r.p.m., complete with electric starting motor and storage battery, this battery being maintained in proper working condition by a

small generator which can be operated at any time by belt from the coupling of one of the motor-driven domestic pumps. This unit is shown on Photo No. 12072.

The main gasoline tank is located in the usual manner underground and outside the building with the gasoline pump and auxiliary tank in a small concrete annex, an extension shaft and tell-tale passing through the wall for the purpose of operating the pump from inside the station. The cost of this unit installed was about $7,000.

An automatic valve has been designed for cutting off the gasoline from the engine, should the operator forget to do so when he shuts down the unit, in which case a leaking carburettor valve might allow gasoline to escape. This valve is controlled hydraulically from both the suction and discharge of the pump and operates when the engine stops, independent of pressure on the pump from the town mains.

It has been sought by the above arrangements and by fire walls and fire doors separating the electrical from the gasoline equipment, to make gasoline reserve for fire thoroughly reliable and satisfactory, when in charge of competent operators.

The total capacity for fire service under 100 pounds pressure amounts to 3,400 g.p.m., made up of 1,200 g.p.m. for the gasoline unit, 1,700 g.p.m. for the electric units and 500 g.p.m. for the steam plant.

The steam unit is to be replaced with a second gasoline unit, and an additional unit for domestic service is under consideration.

The book value for the filter plant is $8,700, and for the electric pumping plant $9,200.

The accompanying illustrations show the mechanical filter tanks, the gasoline engine driven fire pumps and the mechanical calcium hypochlorite feed.

White Cross of Prevention

Is not

An accident prevented—
many dollars saved?

An accident prevented—
a productive life or limb conserved?
uninterrupted, therefore, increased production?

An accident prevented—
a father saved to his family?
a family saved from charity?
a mine well ventilated?
a thousand happy homes?
a million dollars saved ?

An accident prevented—
a high explosive plant properly located?

An accident prevented—
a town still on the map?

An accident prevented—
a boiler filled with water?
a plant still in operation?

An accident prevented—
an engineer educated to caution?
"The Limited" at its destination?
the passengers home in safety?
the railroad's first duty fulfilled?

Is not accident prevention the best and cheapest compensation?

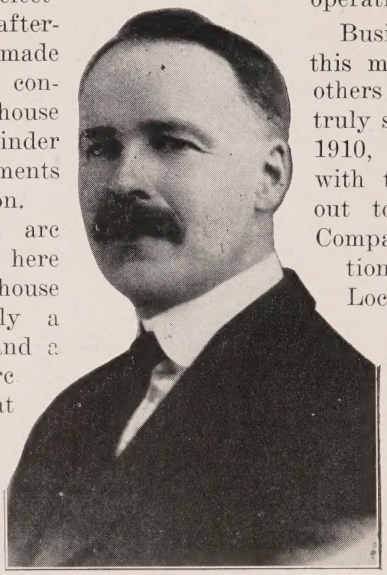
Is not the White Cross of Prevention an even greater national asset than the Red Cross of First Aid?

—*Literary Digest.*

WHO'S WHO *in* HYDRO?

WHEN the Bell Telephone Company strung their first wires over the roofs of houses in Port Hope, I was a pretty small boy, but the mystery of being able to talk over a wire, got me thinking and many were the experiments I tried with tin cans and empty cigar boxes in the quest for the secrets of electricity. A little later the discovery of some old books by Farady gave me an inkling into the A, B, C of electtricity, and shortly afterwards a pair of homemade electrical telephones connected a neighbors house with ours. The remainder of one of these instruments is still in my possession.

The open electric arc light was introduced here in 1885. The power house then containing only a small steam engine and a twenty-light, Ball arc machine had a great attraction for me. I soon found myself in charge of this plant, which grew to some seventy-five arc lamps and we moved our power house and operated by water power.



V. B. Coleman

About six months of this and a more lucrative position near Montreal saw me away, but again in less than a year I was back in Port Hope associated with the old Port Hope Electric Light and Power Company, which had purchased a water privilege north of the town and were installing a 750-light Slattery alternating system in addition to the arc machines. This machine was one of the first alternators in Canada and we had many visitors inquiring as to the operation of same.

Business grew and soon this machine was too small, others were installed. Yours truly stayed on, and when in 1910, after being 21 years with the company, we sold out to the Electric Power Company, I accepted a position with this firm. The Local Manager was killed, shortly after this transfer, and I accepted the position, holding it till acquired by the Ontario Government and turned over to the Hydro-Electric Power Commission of Ontario to operate. Apparently I was turned over in the transaction, for I am still here.

Letter re Meter Inspection Charges

Ottawa, July 16, 1919.

Office of
The Deputy Minister,
F. C. T. O'Hara.

Re Inspection of Electric Light and Power Meters.

Dear Sir:

With further reference to your letter of July the 12th, addressed to the Right Honorable Sir George E. Foster, and which was acknowledged by the Minister yesterday, I have to state, with reference to the revenue from the Inspection of Electric Lights and Power Meters, that it cannot be said that the statements, as published, are correct, and a change will be made now that this branch of the Government Service is attached to the Department of Trade and Commerce. Until a few months ago this was attached to the Department of Inland Revenue.

The sub-division of the charges as between gas and electricity has not been correct, but hereafter it is proposed to apportion the cost to the amount of work done and the amount of revenue produced. In this connection it may also be pointed out that the cost of the electricity and administrative staffs at Ottawa is not charged to the service referred to, but is paid out of another Government vote. The cost in this connection is approximately $15,000 per annum, and undoubtedly should be chargeable to the Inspection Services as provided in Section 27 of the Inspection Act.

As to a reduction in the inspection fees it is true the law stipulates that this will be such as will meet as nearly as may be the cost of the administration of the Act. This means, of course, the total cost, including the Inside Service.. Ninety per cent. of the meters tested will doubtless come under the 60-cent fee. As the inspection requirements under the law are that a meter shall be verified before being fixed for use and verified once in six years thereafter, this means an inspection fee of 10 cents per annum per meter. It is recognized, of course, that a meter may need testing oftener than the period named, but the makers of the meters, and not the department, should be held responsible for this.

The Chief Electrical Engineer of this Department, who has a wide knowledge of meter inspection work, informs me that the Canadian fee of 60 cents is lower than that of any country in Europe or America for a similar class of meter.

However, if after the reorganization which is necessary by reason of the transfer of this Branch of the Government Service from the Department of Inland Revenue to the Department of Trade and Commerce, it should be found that the amount of revenue exceeds the cost of administration by any considerable amount, the question of a reduction of fees will then be considered. At present, however, on account of the increased cost of technical labor and instruments, and the fact that all expenses are not charged up in the account referred to, it is not thought that any change should be made.

Yours truly,

(Signed) F. C. T. O'HARA.

S. R. A. Clement, Esq.,
Association of Municipal Electrical
Engineers of Ontario,

Advantages of Electrification Explained to Canadian Engineers

Mr. F. H. Shepard of Westinghouse Electric and Manufacturing Co. Delivers Interesting Address.

AT the recent annual meeting of the Engineering Institute of Canada, F. H. Shepard, director of the heavy traction department of the Westinghouse Electric and Manufacturing Company, presented a very able paper on the electrification of railroads. In his address, Mr. Shepard brought out very clearly the growing need for electrification in this country and its many advantages, as well as the remarkable results which have been obtained in its application.

Due to the vast area of this country, its growth and prosperity have depended largely upon transportation facilities, and for this reason any improvement in the railroad condition is especially important. That the substitution of electric for steam power will improve these conditions has been amply demonstrated in every instance where it has been applied. The only explanation, therefore, why railroad electrification is so limited may be ascribed to that inertia which halts the undertaking of large works, accompanied, as they inevitably are, by such complications as questions of finance, immediate necessity, immediate return, etc.

An advantage of railroad electrification rests largely in the ease with which large amounts of power can be used for a single train, and in the facility with which electric power can be applied, regulated and controlled. These advantages secure fewer and accelerated movements of train units and larger trains as well. Increased capacity and service, therefore, directly obtains from existing tracks, terminals and equipment.

The ability for service of electrical equipment as compared with steam is truly amazing. The length of time out of service necessary to insure reliable operation is very small—a common schedule for inspection of electrical equipment is at the end of 3,000 miles operation, while a much greater mileage is frequent, and there are individual records as high as 10,000 to 12,000 miles. The maintenance is, therefore, considerably less for an

electric locomotive than for steam, and this saving, which is generally taken to be about 50 per cent., will probably be materially increased in future installations.

The ever-present necessity for increased efficiency in transportation has already brought about a very material increase in size of trains. With steam power this has been secured at great increase in size of locomotives, revision of line, reconstruction of bridges, etc. Undoubtedly, had electrification been available, much of this capital expenditure would have been obviated, owing to the flexibility with which electric power can be applied.

The saving of fuel due to the use of electric power is, of course, complete in the case of Hydro-Electric supply and is 15 per cent. more from steam electric generating stations. This considerable saving is due both to the great efficiency of steam generation in large units under the economical arrangements obtaining in modern power-houses and to the avoidance of losses at the locomotive itself.

In these days of increased costs, that for the supply of electric power is almost alone in having been stationary or even reduced during recent years. This has been due to the economies obtained by the generation and distribution of large amounts of power. The present, therefore, seems to be a particularly opportune time for actively undertaking the extension of railway electrification.—*Electrical Review.*

Bakelite and Condensite

Bakelite is a material which in recent years has come to have various important uses in electrical work, and in more than a score of big industries. Bakelite, invented by Dr. Backeland, and named after him, is a product of carbolic acid and formaldehyde. These two liquids when brought together forms something that appears much like ordinary resin, from which paints and varnishes are made.

Here is the peculiar feature of the compound; if allowed to solidify it may be re-dissolved by any of the several chemical solvents. But if this product is heated beyond a certain point where a secondary reaction takes place, its characteristics undergo a complete change. For one thing it becomes practically impossible to dissolve it by any chemical forces known.

It has a high insulating value, and is used not only in various electrical apparatus, but in numerous details of automobile construction. The little cap on the radiator which appears to be coated over with hardened rubber is really covered with bakelite. Many steering wheels are also made of the same material, and electrical starting and lighting equipment on automobiles was greatly simplified by its use.

In its solvent state bakelite is used in varnishes, and has revolutionized the methods of lacquering brass beds. There is a fair chance that the buttons on your coat are bakelite, also the head of your wife's hatpin, and the body of your child's doll.

It so happened that just about the time that bakelite was discovered another man, the late Dr. Aylesworth, in the laboratories of Thomas A. Edison, was putting the finishing touches to a similar compound of carbolic acid and formaldehyde, now known as condensite. Condensite was developed by Dr. Aylesworth in his quest for material that would make a more durable phonograph record than was then

known. The world had long been waiting for just such a compound, and it was a strange coincidence that two scientists, working independently, should hit upon it at practically the same time.—*United Briefs.*

Some Facts in Recent Electrical Developments

An Address given to the London Rotary Club, February 10th, 1919

By E. V. Buchanan

General Manager, Public Utilities Commission, London, Ont.

ELECTRICITY, that mysterious something which is perhaps the greatest factor in our daily lives, we know hardly anything about. We cannot see it, taste it, hear it, smell it, or feel it. Only the results of its action are apparent to our senses. I remember that Lord Kelvin, lecturing to his class in Glasgow University, getting his eye on a student whose thoughts were evidently far from the class-room, pounced on this man and said: "Will you please tell me what electricity is?" The startled student stammered and said: "Please, sir, I have forgotten." Kelvin then turned to his class and said: "Gentlemen, behold this sad spectacle. The only man that ever knew what electricity is, has forgotten."

One cannot talk these days without thinking first of the war, and secondly, of reconstruction. Electricity has played no small part in the solution of many of the war's problems, apart from the application of power in factories. In fact, a long talk could be given on this subject alone, but we must content ourselves with the statement that electrical methods have been used for the detection of pirate submarines, that there have been wonderful inventions in wireless signalling and telephones for the army and navy, aircraft devices, searchlights of novel design and great power, electric welding, X-ray machines of great simplicity and accuracy, and many other lines too numerous to mention.

When we come to think of reconstruction, we consider perhaps too strongly the question of commercial prosperity without giving consideration to what, in my mind, is more important—human contentment. No city, province, or nation can be successful with commercial or industrial prosperity alone, but must have, hand-in-hand with that, human contentment.

At this point I might touch on the municipal ownership of the electrical utilities in this province, and I would like to impress on you that Municipal Hydro Departments do not exist primarily for the purpose of making profits, nor even, let me say, to give the manufacturers cheap power, but to make the working man's lot, together with that of his wife and family a happier one.

In connection with the appliance sale department, which is operated by

the local commission, the idea is prevalent that the object in having such a store is to sell appliances to increase the amount of power used on the system, and therefore make more profits. Let me say emphatically that this is not so. The idea is to find out and market the best appliances that can be bought for the least money, which are of vital importance in making the task of the housewife easier and more congenial.

Electrical service for the benefit of the housewife is not confined to the branch with which I am particularly associated, but covers many other branches, two of which are the electric street car and the telephone system. The wife of the well-to-do man has her maids to do her work, has lots of time to do shopping and visiting, and can make these trips in her own limousine. The wife of the working man has to depend on other means of communication, and therefore the street car and the telephone should be within reach of every working man's home. Look what a boon it would be if cars passed within a stone's throw of every house in the city, and if the woman who has her children and other household tasks to attend to could order her supplies over the telephone, and when she has a few minutes to spare but not able to go out, could talk with her friends by the same medium.

I would like now to tell you briefly of some of the newer electric developments with a little more detail, both in the commercial world and for the household. All of you are, of course, familiar with the application of electricity in the factory as far as the driving of shafting and machinery is concerned, by means of the electric motor, but it is predicted that the electric heating load will eventually surpass the motor load. When I speak of the electric heating load, do not misunderstand me. I do not mean the heating of buildings, and perhaps at this point it might be well to touch on that subject, because there is so much misunderstanding. When we consider the heating of a house, we naturally think in terms of tons of coal. As most of you know, one ton of coal will produce a certain fixed and definite amount of heat. It is impossible to obtain more than that amount of heat from that piece of coal. In the same way, from a unit of electrical energy, it is possible to obtain a fixed amount of heat, and no more can be obtained. One cent's worth of coal will produce very much more heat than one cent's worth of electricity at the present prices, but there is the matter of efficiency of application which must be taken into consideration. The coal has to be burned in a grate or furnace in order that the products of combustion may be carried away to the outside atmosphere. The result is that even in the best designed furnaces about half of the heat from the coal goes up the chimney, whereas in the case of the electric heater every unit of heat generated is dissipated in the room to be heated. This 100% efficiency feature of electric heaters is the reason why the small electric heater is practicable, as an auxiliary, and to my mind this auxiliary heat is the only use to which electric air heating will be put to for many years to come. Tests show that for the average house in the city of London, it would require at least 12 H.P. of electrical energy. Power could be sold now in London at about $25 per H.P. per year, so that electric heating would therefore cost the average householder $300 per year. This, of course, is not

very serious if coal remains at the present price, as on that basis electric heating would only be about twice as dear, and the great convenience would more than offset the cost. But let us consider the amount of power necessary if electric heating were to come into general use. There is in the Province of Ontario, roughly, three million people. Assuming five persons to every household, this would give us 600,000 houses, each house, therefore, taking 12 H.P. would use 7,200,000 H.P. The whole of the potential water powers of the Province of Ontario amounts to some 6,000,000 H.P. Therefore, there is not sufficient water power in Ontario to heat even the existing homes, exclusive of all other domestic, commercial and industrial requirements.

True conservation lies in utilizing a thing for the purpose for which it is best suited, and you will readily see that heating of houses and buildings is not in the interests of the province when the power can be so much better used for industrial purposes. Do not forget that I have already pointed out that electric heating is now 100% efficiency and no improvement can be made in the method of application of electric heat. However, to come back to the point where I digressed, that the electric heating load will eventually surpass the motor load for industrial purposes, I include in this cooking and baking. The day is not very distant when Rotarian John Bridge will turn out his bread from electric ovens, and when Rotarian Reg. McIntosh will toast his corn flakes by Hydro juice. The great advantage of electricity in every known application can be summed up in one word, "Control," and if this is more important in one application than another it is in the heating branch as in baking bread and toasting corn flakes, where one must have absolute control of the temperature, and this can be obtained to a nicety by electricity.

Again, the same is true in japanning ovens and in enamelling ovens. The McClary Manufacturing Company are now doing most of their japanning in electric ovens, and they will tell you that they are obtaining results that they never obtained by any other means of heating.

Another new field is the electric steel furnace which produces the finest known steel. The quality of this steel is indicated by the fact that so far as is known, and contrary to the general experience with other steels, no rail made from electric furnace steel has ever been broken in service. The importance of such a material with regard to continuity in service, and safety to passengers can hardly be estimated.

And lastly, in the commercial field, I should like to mention electric welding. During the war, prizes were offered for the greatest number of rivets driven daily in the shipyards, but a simpler way of putting ships together was discovered, namely, electrically welding the parts. By welding, the ship's plates are not weakened as might be the case when holes are punched, and delays in the drafting room and machine shop are avoided, and again the average welder can turn out more work than the average machinist, in fact, a saving of about 25% in labor, time and cost, by the introduction of electric welding in shipbuilding has been obtained. Nor is construction the only modern application of electric welding to lessen work. This type of welding is used extensively in repairing of all kinds. When the United States entered the

war, they found the boilers and engines on the interned German liners so badly damaged as to appear at first hopelesssly beyond repair. This, in fact, was the aspiration of the German crews. However, the news soon came out that every one of the ships had been successfully repaired and commissioned by the United States Navy, and in the ingenuity used to repair these engines and boilers electric welding played no small share in the work. The estimated cost of repairs on one ship amounted to $32,000 and the time required from 10 to 12 months. By means of electric welding the work was completed in 52 hours at a cost of less than $2,000 for the actual work done.

Saving of labor and time in offices, stores, hotels, office buildings, public buildings and institutions of various kinds is equal in importance to the conservation of labor in industrial activities. The following is a list of some of the different electrically operated devices which are being successfully used for this purpose:

Office Equipment

Adding machines,
Addressing machines,
Bookkeeping machines,
Coin wrapping machines,
Counting machines, coin, ticket, etc.
Date and time stamps,
Dictating machines,
Duplicating machines,
Envelope sealers,
Erasers,
Letter openers,
Mail folders,
Numbering machines,
Stamping machines,
Typewriters, motor-driven.

Store Equipment

Bread slicers,
Candy pullers,
Carriers and pneumatic tubes,
Coffee grinders,
Corn poppers,
Dough mixers,
Ice cream freezers,
Ice machines,
Meat choppers and slicers,
Pumps, liquid and air,
Ranges and electrical heating apparatus.
Tag markers and fasteners,
Wrapping machines.

Building Equipment

Door openers,
Elevators, automatic and escalators,
Floor cleaners, sanders, scrubbers, surfacers, polishers, mops,
Hoists, coal and ashes,
Self-winding clocks,
Temperature regulators, automatic,
Time switches,
Vacuum cleaners, stationary,
Ventilating fans.

Before coming to the application of electricity in the home, I should like to mention the application of electricity to the farm. This has become an accomplished fact around the buildings for both light and power purposes, and the difficulties of transmission of electric power to the more remote points on the farm is now being overcome and electricity is being applied in all ordinary operations. It is apparent from the fact that over 200,000 H.P. in electric motors is now actually used on the farms of this continent, that the phrase "Electricity on the Farm" does not constitute an idle dream any longer. The only thing that is not being done with electricity on any great scale is plowing and cultivating, and this now bids

fair to be a commercial success in the very near future.

On farms, the saving of labor involves not so much the elimination of operations to release men and women for other work, as the reduction of the amount of physical labor required. However, electric labor-saving methods on the farm that eliminate outside help are welcome, in these times, due to the difficulty of obtaining men and women skilled in farm work.

Let me run over a list of electrical equipment now used on the farm, just to give you an idea of the extent of this field:

Alfalfa mill
Bone cutters and grinders
Bottle washer
Cider mill
Cider press
Concrete mixer
Cordwood saw
Corn cracker
Corn cutter
Corn sheller
Cow milker
Cream separator
Cream tester
Emery wheel
Ensilage and fodder cutter
Fanning mill
Feed mixer
Forge blower
Gate opener
Grain elevator
Grain thresher
Grindstone
Grist mill machinery
Hay baler
Hay hoist
Hay press
Horse clipper
Horse groomer
Ice breaker
Incubator and brooder
Knife grinder
Lathe
Milk pasteurizer
Milk tester
Milking machine
Pea and bean huller
Portable elevator for elevating and piling bales of hay, fodder, etc.,
Potato sorter
Refrigerating system
Root cutter
Sheep shearer
Spraying machine
Thresher
Water supply system
Wood splitter
Wood saw.

Likewise electric devices which enable the housewife to complete her work in the least time are also labor-savers, for, while they do not reduce the number of people engaged in maintaining homes, they do reduce the physical labor involved and make it possible to take up other pursuits or spend more time on recreation.

The following list gives an idea of the number and variety of electrical devices which have been developed to assist the housekeeper in the performance of her work:

Bread and cake mixers
Buffing and polishing motor
Butter worker
Coffee mill
Cooking range
Churn
Clothes washing machine
Clothes dryer
Cream whipper
Dish washing machine
Egg tester
Floor waxer and surfacer
Food chopper
Ice cream freezer
Ironing machine and iron
Meat grinder
Refrigerator
Sewing machine motor
Vacuum cleaner
Vegetable peeler and parer
Water heater.

Most important is the electric cooking range, to which I should like to devote a minute or two. Some years ago electric cooking was looked upon as merely a fad and of no real practical importance. Your local electric department was so far convinced that it was the coming means of cooking that the matter was gone into very thoroughly and carefully, and specifications were prepared for the construction of an electric range, and along these lines the modern range has developed. When a good range was secured, then the next thing was to convince the public that electric cooking was a success. Little parties were organized and interested housewives were invited to come to lunch at the Hydro Shop and partake of a

meal cooked electrically, at the close of which the demonstrator showed how the meal had been cooked. The electric range is clean, there is no soot or smoke. A kettle or pot may be used on an electric range for years and never lose its original brightness or become discolored. Then there is the convenience. The electric range is "matchless." All one has to do is to snap a switch to get a certain heat, snap it again to get another heat, and again a third time to get a third heat. Each time the switch is in the same position the heat produced is exactly the same. The oven is the most wonderful part of the electric range. The temperature is so uniform that pies can be baked and cakes browned with absolute certainty. Meat and fowl can be roasted in the electric oven with very little loss in weight or evaporation of the juices. In any other oven the loss in weight amounts to as high as 35%, while in the electric oven the loss in weight does not amount to more than 10%. This is another great consideration in these days of the high cost of food.

Finally, with the present rates in use in London, electric cooking is the cheapest method known. There are 700 ranges in use in London, to say nothing of thousands of smaller cooking appliances, and I feel very confident in saying that there are 99 in every 100 of these users satisfied with their ranges. The names of the other appliances you are all familiar with. The electric iron, toaster, coffee percolator, and vacuum cleaner, everyone has in his own home. Following these appliances I would mention the electric range as the next in order of importance, and after that the electric washing machine. Electric washing machines are becoming very popular and 100% of the users are satisfied.

Another machine which has just come on the market recently, and which I trust will be for sale at such a price as to make it within the reach of many, is the electric ice machine. What would your wife give to have all the trouble and inconvenience due to the iceman eliminated. On the top of the refrigerator there is a little compressor which is just a small model of the large artificial ice plant. This machine is controlled automatically and maintains a constant temperature in the ice box. There is also a tray where small blocks of ice may be cast for use on the table. The cost of operating this machine is very, very small, and practically the only cost worth figuring is the fixed charges on your investment.

There are innumerable devices which I could tell you about, but time goes on. I would just like to tell you that over 20,000 appliances have been sold by the Hydro Shop in the last five or six years, and this will give you some idea of the enormous increase in the use of electric appliances in the home.

Another fact which is striking, is that the number of units used per month for every home in London has increased 50% since 1910.

While I admit to considerable prejudice in favor of things electrical, I think that in no other field of engineering has there been such real improvement and a condition which so nearly approaches to 100% efficiency as has been shown in the field of electricity. This record is not the result of accident. It has been due to the enthusiastic attention to their work by Scientists and Engineers. They have wanted the best; have not been content with 75% to 80% when something better was attainable.

Channels of Distribution Between the Manufacturer and Consumer

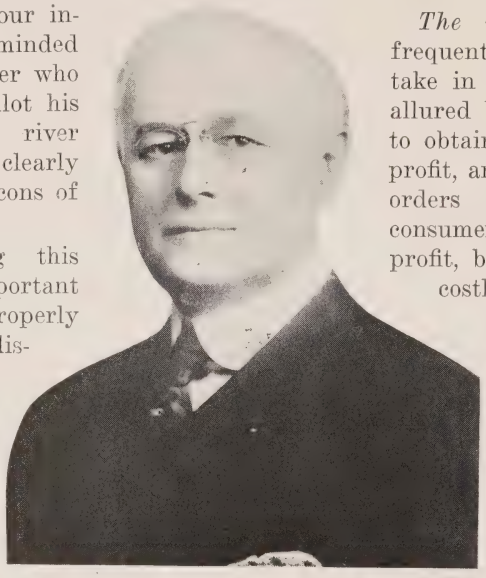
Address by Samuel Adams Chase at a Meeting of the New York State Association of Electrical Contractors and Dealers,

WHEN requested by your Secretary to address you on this subject, it occurred to me that *the channels of distribution in the Electrical Industry were indefinitely marked with trade beacons of*

Trade organizations,

Proper trade differentials,

Proper codes of practice and ethics, supported by absolute knowledge of what each of these beacons mean to the captains of our industry, and reminded me of the mariner who endeavored to pilot his ship through a river which was not clearly marked with beacons of safety.



Samuel A. Chase, Special Representative, Westinghouse Electric and Mfg. Co , Pittsburg, Pa.

In considering this subject three important factors should properly enter into the discussion, viz:—

Economic distribution,

Effective distribution,

Adequate distribution.

The product of this cargo to be distributed from the manufacturer to the consumer is made up principally of merchandizing or resale electrical appliances and supplies, and does not include, in its bills of lading, lighting or power apparatus.

The various channels of distribution in the past from the manufacturer to the consumer may be divided into the following groups:

By the manufacturer direct.

By the Jobber-Wholesaler.

By the Manufacturer's Agent.

By the Central Station.

By the Hardware Merchant.

By the Dry Goods Store.

By the Drug store, and in some instances by various other merchants not strictly in the electrical supply business.

By the Contractor-Dealer.

The manufacturer has frequently made the mistake in the past of being allured by the temptation to obtain the middleman's profit, and has taken small orders direct from the consumer, at an apparent profit, but has learned by costly experience that this so-called profit is wiped out by the cost of obtaining and handling the orders, and the result is not only a net loss in money but a disturbed and unhealthy condition in the trade, but it has in some instances taken years of experience to teach some manufacturers the wisdom of a policy of selling his merchandizing product to the Consumer through the middleman, recognizing the service rendered by the Jobber and the Contractor-Dealer.

The manufacturer has, in some instances, chosen the direct route to consumers in the past, due to the uneconomic, ineffective and inadequate distribution through other channels, and a hesitancy on the part of the middleman to create a sufficient demand for the goods manufactured, and although a definite sales policy has been adopted by some manufacturers of selling direct and through the middleman at the same prices, their direct sales exceed all others by a large percentage notwithstanding the local influence of the middleman and the cargo close at hand.

I will venture to state that the average manufacturer will welcome the day when it will be possible to economically and efficiently distribute its merchandizing product exclusively through the Electrical Jobber and Retailers (Central Station and Contractor-Dealer), but these channels are not yet deep or broad enough or sufficiently safe and efficient to warrant any manufacturer with a large sales organization in the field to sell exclusively through the Jobber and Retailer.

The Jobber or Wholesaler has done in the past and in some instances at the present time still does a retail business in addition to a wholesale business, and sells to other jobbers, to central stations, to Contractor-Dealers and to Consumers, and in some instances, I regret to state, sells to Consumers without recognizing, in the form of a differential, the service rendered by the Contractor-Dealer; in other words, sells to the Consumer at the Dealer's price, which practice is not only unethical but demoralizes the Contractor-Dealer business to such an extent that it makes that class in the industry seemingly distrustful and quite naturally has a tendency to prevent his engaging in the retail business, hence retarding sales and expansion.

The Jobber of the past has been somewhat like many Manufacturer's Agents, and has shipped an order calling for a miscellaneous lot of goods from the four winds of the earth direct from the various manufacturers to the Contractor-Dealer or Consumer because of not carrying a sufficient stock in his warehouse.

Cross Arms from the State of Washington.

Pins and Brackets from North or South Carolina.

Pole Line Hardware from Illinois and Pennsylvania.

Bare and Insulated Wires from Massachusetts or New Jersey.

Wiring Devices from Connecticut or New York State.

Bell Wiring appliances from Pennsylvania or New England, causing delayed and expensive shipments, but *the Jobber of to-day* assembles all these goods in his own warehouse and distributes for the Manufacturer complete, in one shipment, frequently the same day the order is received, which is of great advantage to the Contractor-Dealer. *Therefore, the Jobber can be the natural, economic and efficient channel of distribution from the Manufacturer to the Contractor-Dealer.*

The Manufacturer's Agent's policies vary. Some carry a small stock and ship and invoice customers, while others carry no stock and are simply order-takers for the Manufacturer, and some sell indiscriminately to Jobbers, Contractor-Dealers, and Consumers, and should in reality be classed as salesmen for the Manufacturer, who has no sales organization in the field.

Central Stations have been pioneers

in the sale of and distribution of Incandescent Lamps, and that channel was marked with beacons of free renewals and cut prices, alluring the industry not to a Haven of Safety, but to a rock-bound Coast of Disaster.

Now, the channel has changed to the Jobber, Contractor-Dealer and Central Station, with the percentage clearly marked with beacons of ethical merchandizing and intensive selling, producing absolute fairness in competition between the competing groups—and the Contractor-Dealer with a well-located, attractive retail store now plays an important part in the Channel of Distribution of lamps from the Manufacturer to the Consumer.

The Flat Iron, Washing Machine and Vacuum Cleaner and other household appliances were introduced, principally by the Central Station, who did the pioneer work on these appliances as well as on Incandescent Lamps, and it is my belief that the Central Station on account of its organization, prestige, financial responsibility and desire to add kilowatts to its lines, will always be the logical pioneer and pilot the way for the Jobber and Contractor-Dealer on Household, Current-Consuming Devices, and it would be very unfortunate to the Manufacturer and to the Consumer if the Central Station should go out of the retail business properly conducted on an ethical basis, and most Central Stations will always carry the introductory or development expense of placing new current-consuming devices on the market. It is, therefore, up to the Contractor-Dealer to co-operate and take full advantage of the demand created.

View of London Hydro Shop Window, featuring a tulip show held by the London Horticultural Society

The Hardware, Dry Goods, Drug Store, and other kindred merchants have probably done more to advertise electrical merchandizing products than other distributors, but I do not always approve of the character of their advertising, because, like the Central Station advertising, its principal story is "cut-prices." With recognized business ability, however, attractive stores and display windows and unquestionable financial standing the call of the siren has been so alluring that it has wrecked many a manufacturer's ship in the channel of distribution to the consumer.

Each of these groups, however, create and obtain a certain amount of business which ordinarily could not be obtained by strictly electrical concerns principally *because these merchants make it easy for the housewife to obtain electrical appliances,* for the reason that their stores are attractive, located in the shopping district frequented by ladies, and in charge of an efficient sales organization, and they will continue to increase their electrical departments and sales and will attract the manufacturer as one of the efficient and economic channels of distribution to the consumer, unless the Contractor-Dealer becomes alive to the situation and the necessities of the public and parallels the methods of these merchants.

The beneficial results through a plan of scientific merchandizing, practical trade co-operation and organization advocated by Mr. Goodwin, about which you are all familiar, so ably supported by the Electrical Press, Manufacturers, Jobbers and Central Stations will unquestionably result in making the specialized Electrical Retailer, whether he be Central Station, Jobber, or Contractor-Dealer, the dominating channel of distrubution from the manufacturer to the ultimate consumer.

The Contractor-Dealer has not until recently become a merchant, and I don't know as I can blame him for the reason that apparently all classes in the industry have looked upon him as a necessary evil rather than an economic necessity. All other classes in the industry have been cultivated to a high degree, but the Contractor-Dealer until recently has been allowed to drift, unaided, uncultivated, and looked upon as a parasite, superfluous in the channel of distribution, and, rudderless, without a beacon light to guide him, has been wrecked on the rocks of commerce.

The Contractor-Dealer, because of these facts, and realizing there was no stability to the prices of merchandizing appliances or wiring devices, has *not* taken advantage of the opportunity presented and opened a sufficient number of attractive retail stores, and the Channel of Distribution from the Manufacturer to the Consumer via the Electrical Dealer route has made it difficult rather than easy for the housewife to purchase electrical appliances.

Manufacturers and Jobbers alike have sunk the Contractor-Dealer ship in the past through unethical and other unbusinesslike methods, frequently rendering it impossible for the Dealer to distribute to the Consumer at a profit, and the goods purchased from the Manufacturer for the purpose of distributing to the Consumer remain on the shelves, slow-moving, and often become obsolete because of these unethical methods.

Channels of Distribution change like rivers and we cannot force distribution from the Manufacturer to the Consumer through uneconomic channels because, like rivers, such a

distribution will back up and create a new channel. Some rivers don't change their channels, but the channels of navigation sometimes change, and so does the channel of distribution. However, just as the channels of navigation in a river change from time to time due to natural elements, forming sandbars, sand pits and other elements dangerous to navigation, which may be changed by design through the medium of engineering talent and modern machinery by the application of the dredger, tide walls and jetties, so may the channels of distribution of electrical merchandizing be changed by the application of scientific merchandizing methods directed by the best thought and activity of the Contractor-Dealer.

I am firmly convinced that by an aggressive sales policy by the Contractor-Dealer in co-operation with the Jobber, by maintaining high-class specialty shops, active interest in his association and by the most friendly relations with the manufacturer, Central Station, Consulting Engineer, Builder and Architect, the Channel of Distribution of the Contractor-Dealer will gradually become wider and deeper until he will become a dominant factor in the percentage of material distributed through his channel and will be a powerful factor in the future in molding the policy of the Manufacturer towards a definite decision to recognize the Contractor-Dealer to a greater extent in the future as the most economic and effective distributor of resale products.

"*The open meeting*" of the Contractor-Dealer is a necessity and is commanding the respect of Manufacturers, Jobbers and Central Stations, and through the knowledge these groups obtain of the problems of the Contractor-Dealer to this extent will they will be able to lend co-operation, thereby causing to flow an increasing percentage of merchandize through the channel of the Contractor-Dealer.

I hope the time will come when every Contractor-Dealer will be a member and attend all State Conventions and includes at these meetings representatives of Manufacturers, Jobbers, Central Stations, Architects, Engineers and the Press, so that all can appreciate and understand the problems of each other, thereby establishing friendly and ethical relations, making it possible to navigate all ships in the industry safely through a definite channel of distribution from the Manufacturer to the Consumer.

The trade, like the flow of a river, seeks the channel of least resistance—the better business man the Contractor-Dealer develops to be, the more prominent the location of his store, the character of his store, the support which he gives to his trade associations, the manner in which he conducts his trade association, the character of officers of his association, the conduct and manner of presentation of his trade problems through committees when dealing with the Manufacturer or Jobber, all tend toward removing barriers and resistance and aid in directing the flow of trade through the Contractor-Dealer Channel.

Boys, if you were going to take a boat trip from New York to Albany on the Hudson River and there were several lines of competing steamships, the fare on all lines is the same; in one case one company maintains a palatial steamer with a record for speed and safety, and equipped with every modern convenience for your comfort—the other company maintains a second rate boat having every evidence of decay, invariably getting into difficulties, with a record of de-

lays and disaster; which of these two lines would you choose for your trip? I will let you give the answer.

Now, the Manufacturer is faced with the choice between certain channels for the distribution of his product —in one channel he has the palatial department store, well managed, with unquestionable credit standing—then he has the Central Station and the Jobber, and against this he has the Contractor-Dealer, who in the past has not always appealed to him in a favorable light as compared to the other channels just mentioned, but with the methods they are now employing, with attractive retail stores, located conveniently for the buying public, intensive sales methods, improvement in organization, proper presentation of problems through able committeemen, preventing forcible rather than arbitrary arguments to attempt to force the flow of trade, the Contractor-Dealer is every day commanding a higher respect from Manufacturer, Jobber and Central Station, and is causing them all to think and to think hard which must result, if they continue along these constructive lines, in causing an increasing percentage in business flowing from the Manufacturer through the Jobber-Contractor-Dealer Channel.

In conclusion I would suggest that the Channel of Distribution in which the Contractor-Dealer navigates the beacon be labeled:

Organization,
Co-operation,
Ethical Merchandising Policies,
Determination,

and with these slogans properly applied there can be but one answer, and that is *the Contractor-Dealer ship will be the flagship and lead the squadron through the Channel of Distribution from the Manufacturer and Jobber to the Consumer.*

Accidents That Could Have Been Prevented

WHILE a pipe fitter was connecting a gas heater, a fitting he had laid on top of the boiler fell off and struck him on the head.

Tools and fittings should not be left where they are liable to fall on anyone working below.

A meter reader, in going from one house to another, climbed over the intervening porch rail. His foot caught in the rail and caused him to fall, injuring his face and leg.

Taking short cuts frequently results in injuries. Be careful and use the ordinary passageways.

While two workmen were carrying a heavy casting ,one of them lost his grip. As a result, the other workman strained his back.

Care in seeing that he had a secure grip would have avoided this accident.

While making a crate, a nail buckled, causing the hammer to glance off and strike the workman's finger.

Injuries due to such causes are usually the result of inattention. Care in gauging the force and direction of the blow will avoid such accidents.

A workman turned a lock switch on a railroad spur and dropped the switch handle on his foot.

A little forethought in this case would have saved the workman from a painful experience. When throwing a switch, the feet should be placed on either side of the descending handle in order that it may not strike the operator.

While a meter reader was clearing a passageway to a meter, a rusty nail entered his hand.

As meters are usually in dark locations and often over an accumulation of rubbish, meter readers should use their electric torches freely and be careful while walking in or clearing passageways.

A pipe fitter jumped from his work onto a pile of lumber and ran a nail into his foot.

Nails should be bent over or removed as work progresses in order to prevent injuries due to stepping upon, or being caught by, the projecting nails.

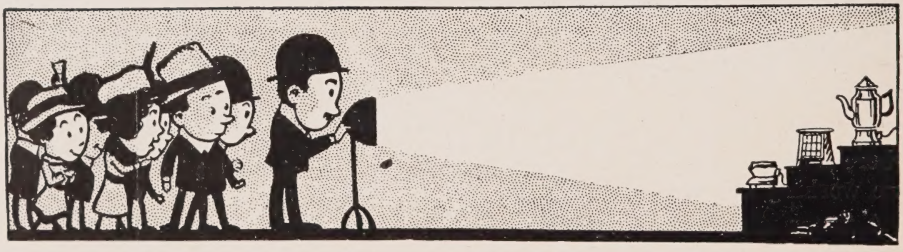
A workman, while cutting rivets, allowed his sledge to strike his leg.

Another sample of carelessness while using a sledge that might have resulted in a broken leg.

A workman rode in a bucket on a cement conveyor to reach his work on an upper level. When the bucket reached the platform, he was dumped out and sprained his ankle.

A sample of a dangerous practice on some construction work. Workmen should be cautioned against using conveyors for any other purpose than that for which they were designed and to refrain from using them for passenger purposes. It is a practice that is liable to result in severe injuries.

—*Safety News.*



Hydro Municipalities

NIAGARA SYSTEM
25 Cycles

	Pop.
Acton	1,570
Ailsa Craig	462
Ancaster	400
Ancaster Township	4,577
Aylmer	2,119
Ayr	780
Baden	710
Barton Township	6,061
Beachville	503
Biddulph Township	1,750
Blenheim	1,257
Bolton	727
Bothwell	695
Brampton	4,023
Brantford	26,601
Brantford Township	7,739
Breslau	500
Brigden	400
Burford	700
Burford Township	3,882
Burgessville	300
Caledonia	1,236
Chatham	13,943
Chippewa	707
Clinton	1,981
Comber	800
Dashwood	350
Delaware	350
Dereham Township	3,176
Dorchester	400
Dorchester S. Ty.	1,457
Drayton	613
Dresden	1,403
Drumbo	400
Dublin	218
Dundas	4,834
Dunnville	3,286
Dutton	840
Elmira	2,065
Elora	1,005
Embro	472
Etobicoke Township	5,822
Exeter	1,504
Fergus	1,679
Flamborough E. Tp.	2,229
Forest	1,421
Galt	11,920
Georgetown	1,654
Goderich	4,553
Grantham Township	3,133
Granton	300
Guelph	16,022
Hagersville	1,053
Hamilton	104,491
Harriston	1,563
Hensall	717
Hespeler	2,887
Highgate	427
Ingersoll	5,300
Kitchener	19,380
Lambeth	350
Listowel	2,291
London	57,301
London Township	6,024
Louth Township	2,212
Lucan	643
Lynden	662
Markham	909
Merriton	1,670
Milton	1,947
Milverton	929
Mimico	2,004
Mitchell	1,656
Moorefield	335
Mount Brydges	500
New Hamburg	1,398
New Toronto	1,423
Niagara Falls	11,715
Niagara-on-the-Lake	1,318
Norwich	1,093
Norwich N. Township	2,029
Norwich S. Township	1,907
Oil Springs	537
Otterville	500
Palmerston	1,843
Paris	4,437
Petrolia	3,047
Plattsville	550
Point Edward	937
Port Credit	1,179
Port Dalhousie	1,318
Port Stanley	831
Preston	4,949
Princeton	600
Ridgetown	2,080
Rockwood	650
Rodney	626
Sandwich	3,077
Sarnia	12,323
Scarborough Township	5,525
Seaforth	2,075
Simcoe	4,032
Springfield	422
St. Catherines	17,917
St. George	600
St. Jacobs	400
St. Mary's	3,960
St. Thomas	17,216
Stamford Township	3,418
Stratford	17,371
Strathroy	2,816
Streetsville	500
Tavistock	974
Thamesford	504
Thamesville	742
Thorndale	250
Tilbury	1,605
Tillsonburg	3,059
Toronto	460,526
Toronto Township	5,008
Townsend Township	3,268
Vaughan Township	4,059
Walkerville	5,349
Wallaceburg	4,107
Waterdown	696
Waterford	1,027
Waterloo	5,091
Waterloo Township	6,538
Watford	1,115
Welland	7,905
West Lorne	708
Wellesley	583
Weston	2,283
Windsor	26,524
Woodbridge	615
Woodstock	10,004
Wyoming	526
Zurich	450
Total	1,060,915

SEVERN SYSTEM
60 Cycles

Alliston	1,237
Barrie	6,866
Beeton	588
Bradford	946
Coldwater	617
Collingwood	7,010
Cookstown	635
Creemore	599
Elmvale	775
Midland	7,109
Orillia	7,448
Penetang	3,672
Port McNichol	500
Stayner	990
Thornton	250
Tottenham	557
Victoria Harbor	1,542
Waubaushene	600
Total	41,941

WASDELL'S SYSTEM
60 Cycles

Beaverton	821
Brechin	215
Cannington	746
Sunderland	570
Woodville	357
Total	2,709

NIPISSING SYSTEM
60 Cycles

Callander	650
Nipissing	400
North Bay	9,651
Powassan	572
Total	11,273

MUSKOKA SYSTEM
60 Cycles

	Pop.
Gravenhurst	1,600
Huntsville	2,135
Total	3,735

EUGENIA SYSTEM
60 Cycles

Alton	700
Artemesia Township	2,396
Arthur	1,003
Chatsworth	286
Chesley	1,860
Dundalk	750
Durham	1,520
Elmwood	500
Flesherton	428
Grand Valley	586
Hanover	3,310
Holstein	285
Horning's Mills	300
Markdale	904
Mount Forest	1,871
Neustadt	470
Orangeville	2,381
Owen Sound	11,819
Shelburne	1,018
Tara	620
Total	33,057

OTTAWA SYSTEM
60 Cycles

Ottawa	100,561

PORT ARTHUR SYSTEM
60 Cycles

Port Arthur	15,224

CENTRAL ONTARIO SYSTEM
60 Cycles

Belleville	12,080
Bowmanville	3,545
Brighton	1,278
Cobourg	4,457
Colborne	811
Deseronto	2,061
Kingston	22,265
Lindsay	7,752
Madoc	1,114
Millbrook	746
Napanee	2,881
Newburgh	444
Newcastle	600
Omemee	446
Orono	700
Oshawa	8,812
Peterboro	28,996
Port Hope	4,486
Stirling	823
Trenton	5,169
Tweed	1,350
Whitby	2,902
Total	113,718

ST. LAWRENCE SYSTEM
60 Cycles

Brockville	9,473
Chesterville	868
Prescott	2,630
Williamsburg	100
Winchester	1,042
Total	14,113

RIDEAU SYSTEM
60 Cycles

Perth	3,358
Smith's Falls	6,115
Total	9,473

ESSEX COUNTY SYSTEM
25 Cycles

Amherstburg	1,990
Canard River	50
Cottam	100
Essex	1,429
Harrow	375
Kingsville	1,633
Leamington	3,604
Total	9,181

THE aim of the Bulletin is to provide municipalities with a source of information regarding the activities of the Commission; to provide a medium through which matters of common interest may be discussed, and to promote a spirit of co-operation between Hydro Municipalities.